REMARKS

The Office Action of February 21, 2003 rejected claims 46-47 and 50-52 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent 6,052,228 Xie. Claim 53 was rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent 6,052,228 to Xie. Claims 46-47, and 50-52 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of U.S. Patent 6,285,499 to Xie. Claim 53 was rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of U.S. Patent 6,285,499 to Xie. Claims 41-45, 54-58, and 59-63 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6, 8, 14, and 33 of U.S. Patent No. 6.049,426 to Xie. Claims 41-47 and 50-63 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,982,539 to Shirasaki.

By this amendment, claims 41, 45, 46, 50, 53, 54, and 59 have been amended and new claim 64 has been added. Claims 41-47, and 60-64 are therefore pending.

Double-Patenting Rejections

Applicants will submit a terminal disclaimer after determination of allowable subject matter.

Rejections Under 35 U.S.C. § 102(b)

Claim 41 as amended relates to a method of tuning a spatial separation between a first and third port of an optical circulator. In claim 41, a first optical signal travels from a first optical port to a second optical port and a second optical signal travels from the second optical port to a third optical port. The first optical signal, which enters the optical circulator at an angle

and is diverging from a longitudinal axis, is turned towards the longitudinal axis with a first beam angle turner. Next, the first optical beam is turned by a second beam angle turner such that the first optical beam is aligned with the longitudinal axis and exits via the second optical port. The second optical signal, which enters the optical circulator from the second port aligned with the longitudinal axis, is turned away from the longitudinal axis by the second beam angle turner. The first beam angle turner then turns the second optical signal towards the longitudinal axis. The second optical signal will then exit through the third optical port.

Claim 41 requires that the first beam angle turner and the second beam angle turner be separated by a complete gap. By adjusting the complete gap, a spatial separation between the first optical signal and the second optical signal can be adjusted. In other words, adjusting the complete gap adjusts the distance between the first optical signal and the second optical signal and defines the location of the first optical port and the third optical port.

As discussed at the interview, the complete gap can adjust the distance between the first optical signal and the second optical signal because the complete gap controls when the first and second optical signals are turned by the first and second beam angle turners. This is illustrated, in one embodiment, in Figures 2A and 2B. Figure 2A is a top view of an optical circulator and Figure 2B is a side view of the same optical circulator. Although Figure 2B illustrates that the first and second optical signals are traveling in parallel paths from a side view, Figure 2A clearly illustrates that in fact, the first and second beam angle turners turn the optical signals such that their general direction after entering a beam angle turner is different than their direction when exiting the beam angle turner. Figure 2A further illustrates that the beams are not always aligned with the longitudinal axis, but that they diverge from the longitudinal axis at some places. As a

result, the complete gap controls the spatial separation between the first optical signal and the second optical signal.

As further discussed at the interview, controlling a spatial separation between the first optical signal and the second optical signal is not taught or suggested by Shirasaki. The Examiner asserts that Figures 7C, 7D, 8A, and 8B of Shirasaki show a gap. Applicants do not concede that a gap is illustrated. For discussion purposes, however, a gap is assumed. Thus, even if a gap is displayed, adjusting this gap, as discussed at the interview, cannot alter a distance between the first and second optical signals as is required by claim 41.

For example, Shirasaki teaches that, with respect to Figures 7C and 7D, "refraction caused by the first birefringent wedge is normally cancelled by the refraction caused by the next birefringent wedge." *See* col. 9, lines 12-14. Thus, "the average direction of two beams whose polarization planes are different after passing through two birefringent wedges, is the same as that prior to passing through the birefringent wedges, while the split angle is changed by deflection." *See* col. 9, lines 14-18. Thus, Shirasaki teaches that the overall direction of beams passing through the two birefringent wedges is the same. Thus, one of skill in the art learns that the gap cannot be used to change a distance between a first optical signal and a second optical signal because the overall direction of the optical signals, as taught by Shirasaki, is the same.

With respect to Figure 8B, Shirasaki teaches that "in such a configuration, the proceeding direction of light refracted by the first birefringent wedge may be corrected by the second birefringent wedges, so that the average refraction angle of ordinary and extraordinary light can agree with an input direction of the light." *See* col. 10, lines 9-13. Shirasaki further teaches that when a glass wedge is used in place of a birefringent wedge, "the wedge angle of the glass

wedge needs to be increased in order to make the optical paths parallel." *See* col. 10, lines 56-57. In Shirasaki, adjusting a length of a gap can have no affect on parallel optical paths.

Claim 41 requires that the first optical signal and the second optical signal be turned by the first and second beam angle turners. Adjusting the complete gap controls how far the first and second optical signals diverge from the longitudinal axis and therefore controls the spatial separation between the first and second optical signals. For at least these reasons, claim 41 is in condition for allowance and favorable action is requested.

Claim 46 has been amended to require that a first optical beam and a second optical beam pass through the complete gap. Claim 46 further requires that adjusting the complete gap adjusts the distance between the first and second optical beam. For at least these reasons, claim 46 is not taught or suggested by the cited art and is in condition for allowance.

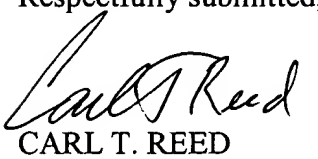
Claim 50 has been amended to require an e-ray and an o-ray, which are diverging from a longitudinal axis of an optical circulator, be turned towards the longitudinal axis by a first beam angle turner and aligned with the second optical port by a second beam angle turner. For at least these reasons, claim 50 is not taught or suggested by the cited art and is in condition for allowance. Claims 54 and 59 have been similarly amended and are also in condition for allowance.

Claims 42-45, 47, 51-53, 55-58, and 60-63 depend from one of the above independent claims and are in condition for allowance for at least this reason. New claim 64 depends from claim 46 and is allowable for at least this reason.

In view of the foregoing, this application is in condition for allowance and favorable action is respectfully requested. In the event of any question, the Examiner is respectfully requested to initiate a telephone conversation with the undersigned.

Dated this 21 day of July 2003.

Respectfully submitted,



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